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# Certification with Oracle Linux 5

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## Introduction

Oracle Linux is fully compatible—both source and binary—with Red Hat Enterprise Linux. Partners testing and certifying their applications on Oracle Linux will, at most, simply install their application on Oracle Linux and verify the information described in this article. When using the Red Hat compatible kernel, Oracle Linux 5 is also fully kABI compatible with Red Hat Enterprise Linux.

This article describes the key points that ISVs should consider when installing and certifying their products on Oracle Linux 5.

## Comparing Oracle Linux 5 and Red Hat Enterprise Linux (RHEL) 5

Applications that run on RHEL will run on Oracle Linux. Trademarks and logos have been removed from a small number of the packages. These are non-functional text or graphics changes that in no way affect any program code, and they do not generate any compatibility issues. Oracle has added its own text file, `/etc/enterprise-release`, so support teams can easily identify that they obtained the code from Oracle.

The Edison Group ran independent tests to validate Oracle's claim of compatibility: Read their report, [Oracle Linux: True Enterprise-Quality Linux Support](#) (see page 15).

Oracle's simple text changes that an installer program might encounter are listed in the following sections.

### Checking the `/etc/redhat-release` File

RHEL provides a text file called `/etc/redhat-release`, which contains a one-line string identifying the specific distribution release. This file is part of the `redhat-release` package. Oracle Linux 5 also contains a text file called `/etc/redhat-release`, which is installed by a package called `enterprise-release`.

The following tables show the data that is present on the initial release of media for each of the releases of Oracle Linux. As of Oracle Linux 5.3, Oracle retains the Red Hat content within the file. Also shown is the file `/etc/enterprise-release`, which contains Oracle content.

RHEL 5	ORACLE LINUX 5
<code># rpm -qf /etc/redhat-release</code>	<code># rpm -qf /etc/redhat-release</code>
<code>redhat-release-5Server-5.0.0.9</code>	<code>enterprise-release-5-0.0.4</code>
<code># cat /etc/redhat-release</code>	<code># cat /etc/redhat-release</code>
Red Hat Enterprise Linux Server release 5 (Tikanga)	Enterprise Linux Enterprise Linux Server release 5 (Carthage)

RHEL 5 UPDATE 1	ORACLE LINUX 5 UPDATE 1
<code># rpm -qf /etc/redhat-release</code>	<code># rpm -qf /etc/redhat-release</code>
<code>redhat-release-5Server-5.1.0.2</code>	<code>enterprise-release-5-0.0.7</code>
<code># cat /etc/redhat-release</code>	<code># cat /etc/redhat-release</code>
Red Hat Enterprise Linux Server release 5.1 (Tikanga)	Enterprise Linux Enterprise Linux Server release 5.1 (Carthage)

RHEL 5 UPDATE 2	ORACLE LINUX 5 UPDATE 2
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.1.0.4  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.2 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-0.0.9  # cat /etc/redhat-release Enterprise Linux Enterprise Linux Server release 5.2 (Carthage)</pre>

RHEL 5 UPDATE 3	ORACLE LINUX 5 UPDATE 3
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.3.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.3 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-0.0.17  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.3 (Tikanga)</pre>

RHEL 5 UPDATE 4	ORACLE LINUX 5 UPDATE 4
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.4.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.4 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-0.0.20  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.4 (Tikanga)</pre>

RHEL 5 UPDATE 5	ORACLE LINUX 5 UPDATE 5
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.5.0.2  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.5 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-0.0.22  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.5 (Tikanga)</pre>

RHEL 5 UPDATE 6	ORACLE LINUX 5 UPDATE 6
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.6.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.6 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-6.0.2  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.6 (Tikanga)</pre>

RHEL 5 UPDATE 7	ORACLE LINUX 5 UPDATE 7
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.7.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.7 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-7.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.7 (Tikanga)</pre>

RHEL 5 UPDATE 8	ORACLE LINUX 5 UPDATE 8
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.8.0.1  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.8 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-8.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.8 (Tikanga)</pre>

RHEL 5 UPDATE 9	ORACLE LINUX 5 UPDATE 9
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.9.0.2  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.9 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-9.0.6  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.9 (Tikanga)</pre>

RHEL 5 UPDATE 10	ORACLE LINUX 5 UPDATE 10
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.10.0.4  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.10 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-10.0.3  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.10 (Tikanga)</pre>

RHEL 5 UPDATE 11	ORACLE LINUX 5 UPDATE 11
<pre># rpm -qf /etc/redhat-release redhat-release-5Server-5.11.0.2  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.11 (Tikanga)</pre>	<pre># rpm -qf /etc/redhat-release enterprise-release-5-11.0.2  # cat /etc/redhat-release Red Hat Enterprise Linux Server release 5.11 (Tikanga)</pre>

### Checking for the redhat-release Package

Oracle Linux 5 does not include the `redhat-release` package. Oracle Linux 5 includes the `enterprise-release` package, which provides a set of files equivalent to those in the `redhat-release` package on RHEL.

RHEL 5	ORACLE LINUX 5
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.0.0.9</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-0.0.4  # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-0.0.4 enterprise-release redhat-release  enterprise-release = 6:5-0.0.4</pre>

RHEL 5 UPDATE 1	ORACLE LINUX 5 UPDATE 1
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.1.0.2</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release</pre>

	<pre>enterprise-release-5-0.0.7 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-0.0.7 enterprise-release redhat-release enterprise-release = 6:5-0.0.7</pre>
--	--

RHEL 5 UPDATE 2	ORACLE LINUX 5 UPDATE 2
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.1.0.4</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-0.0.9 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-0.0.9 enterprise-release redhat-release enterprise-release = 6:5-0.0.9</pre>
RHEL 5 UPDATE 3	ORACLE LINUX 5 UPDATE 3
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.3.0.3</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-0.0.17 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-0.0.17 enterprise-release redhat-release enterprise-release = 6:5-0.0.17</pre>
RHEL 5 UPDATE 4	ORACLE LINUX 5 UPDATE 4
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.4.0.3</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-0.0.20 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-0.0.20 enterprise-release redhat-release enterprise-release = 6:5-0.0.20</pre>

RHEL 5 UPDATE 5	ORACLE LINUX 5 UPDATE 5
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.5.0.2</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-0.0.22 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-0.0.22 enterprise-release redhat-release enterprise-release = 6:5-0.0.22</pre>

RHEL 5 UPDATE 6	ORACLE LINUX 5 UPDATE 6
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.6.0.2</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-6.0.2 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-6.0.2 enterprise-release redhat-release enterprise-release = 6:5-6.0.2</pre>

RHEL 5 UPDATE 7	ORACLE LINUX 5 UPDATE 7
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.7.0.3</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-7.0.3 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-7.0.3 enterprise-release redhat-release enterprise-release = 6:5-7.0.3</pre>

RHEL 5 UPDATE 8	ORACLE LINUX 5 UPDATE 8
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.8.0.1</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-8.0.3 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-8.0.3 enterprise-release redhat-release enterprise-release = 6:5-8.0.3</pre>

RHEL 5 UPDATE 9	ORACLE LINUX 5 UPDATE 9
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.9.0.2</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-9.0.6 # rpm -q --provides enterprise-release config(enterprise-release) = 6:5-9.0.6 enterprise-release redhat-release enterprise-release = 6:5-9.0.6</pre>

RHEL 5 UPDATE 10	ORACLE LINUX 5 UPDATE 10
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.10.0.4</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-10.0.3 # rpm -q -provides enterprise-release config(enterprise-release) = 6:5-10.0.3 enterprise-release redhat-release enterprise-release = 6:5-10.0.3</pre>

RHEL 5 UPDATE 11	ORACLE LINUX 5 UPDATE 11
<pre># rpm -qa grep redhat-release-5 redhat-release-5Server-5.11.0.2</pre>	<pre># rpm -qa grep redhat-release-5 # # rpm -qa grep enterprise-release enterprise-release-5-11.0.2 # rpm -q -provides enterprise-release config(enterprise-release) = 6:5-11.0.2 enterprise-release redhat-release enterprise-release = 6:5-11.0.2</pre>

## Checking the Version of the Distribution

An application may check for the version of the distribution. In this case, RHEL 5 returns 5Server, whereas Oracle Linux 5 returns 5.

RHEL 5:

```
# rpm -q -qf "%{version}\n" -f /etc/redhat-release
5Server
```

Oracle Linux 5:

```
# rpm -q -qf "%{version}\n" -f /etc/redhat-release
5
```

Applications using the `%{version}` rpm check simply need to check for 5, not 5Server.

The preceding items are the only major differences between RHEL 5 and Oracle Linux 5 that might impact installation and certification. If your application installer depends on any of the checks described above, you now have all the information needed to make the minimal changes required to transparently run on both Oracle Linux 5 and RHEL 5.

## Unbreakable Enterprise Kernel

In September of 2010, Oracle introduced the Unbreakable Enterprise Kernel for Oracle Linux. You can [read more about Unbreakable Enterprise Kernel here](#). Beginning with Oracle Linux 5.5,

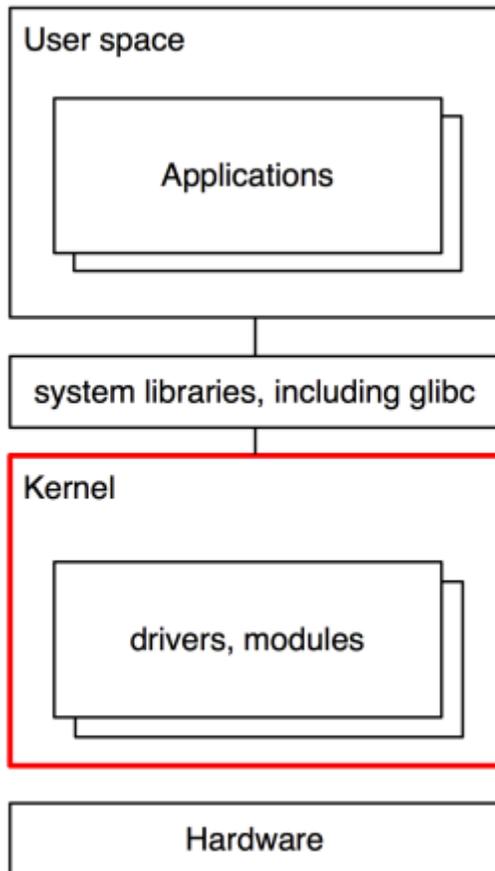
customers have a choice when it comes to the kernel: strict compatibility with the Red Hat kernel or a kernel optimized and recommended by Oracle for stability and performance.

### Unbreakable Enterprise Kernel, Compatibility, and Third-Party Software

One of the main advantages of Unbreakable Enterprise Kernel is that it runs directly on Oracle Linux 5. This means that you can benefit from significant performance improvements and new features without the need to re-install the entire operating system. Because the operating system itself is not replaced, third-party applications will run unchanged.

The Linux operating system is a modular system in which the kernel interacts with the hardware and controls and schedules access to resources on behalf of applications. Applications run in what's called *user space* and call only a stable set of system libraries to ask for kernel services.

Figure 1 is a simplified diagram of the Linux operating system. Installing Unbreakable Enterprise Kernel changes only the box labeled “Kernel.”



**Figure 1. Linux Operating System**

As you can see, installing a kernel does not change system libraries such as `glibc`, the interface that nearly all applications, including Oracle Database, use. The `glibc` version is 2.5 before and after you install Unbreakable Enterprise kernel on Oracle Linux 5.5.

The `sysctl` infrastructure to control kernel settings is also unchanged when you install Unbreakable Enterprise Kernel.

In contrast, device drivers and other kernel modules are tightly coupled with the kernel and will usually need to be recompiled when a new kernel is introduced.

## For ISVs That Also Check the Linux Kernel Version

As of Oracle Linux 5 Update 5, there are three kernels options:

- Unbreakable Enterprise Kernel (2.6.32-x.y.z or newer)
- Red Hat compatible kernel (2.6.18-x.y.z.e15)
- Red Hat compatible kernel with Oracle bug fixes (2.6.18-x.y.z.n.m.e15)

As of Oracle Linux 5 Update 6, Unbreakable Enterprise Kernel is installed and booted by default. The Red Hat compatible kernel is also installed, and you may configure the operating system to boot with this kernel instead. The Unbreakable Enterprise Kernel is provided by the `kernel-uek` package, whereas the Red Hat compatible kernel is provided by the `kernel` package.

```
[root@localhost ~]# rpm -qa | grep kernel
kernel-uek-firmware-2.6.32-200.13.1.e15uek
kernel-uek-2.6.32-200.13.1.e15
kernel-2.6.18-274.e15
```

Starting from Oracle Linux 5 Update 7, Unbreakable Enterprise Kernel is available on x86 and x86-64 platform. To determine whether Unbreakable Enterprise Kernel is installed and running, look for a kernel release version of 2.6.32-100 or newer using the `uname -r` command:

```
# uname -r
2.6.32-100.26.2.e15
```

Also, make sure that the kernel package installed is called `kernel-uek`.

```
# rpm -qa | grep kernel-uek
kernel-uek-2.6.32-200.13.1.e15uek
kernel-uek-firmware-2.6.32-200.13.1.e15uek
```

For Oracle Linux 5 through Update 5, the default installed kernel is the Red Hat compatible kernel, `kernel-2.6.18-x.y.z.e15`. When custom kernels are built for resolving customer issues, any other sort of numbering might be used and should not necessarily be relied upon. However, a standard RHN release kernel follows the format above.

The Oracle Linux 5 Red Hat compatible kernel with Oracle bug fixes keeps the exact same kernel versions and adds more digits at the end to identify potential fixes incorporated. As always, these fixes are applied only if they are critical fixes not yet applied by Red Hat, and Oracle considers the fixes to be important for customer scenarios. Oracle always provides all fixes to Red Hat and the community in the hope that they will be incorporated in a future release. Oracle does not have more than a few patches applied at any given time.

If your product includes a kernel module, please contact us, [ol-ovm-info\\_ww@oracle.com](mailto:ol-ovm-info_ww@oracle.com)

For applications that ship binary kernel modules or check a specific kernel release, `uname -r` or `rpm -q kernel` returns additional digits in the kernel version (as shown in the following tables) only if the Red Hat compatible kernel with Oracle patches is installed. In this case, Oracle appends additional digits to the end of the release number.

Patch files for Oracle-provided fixes are available at <http://oss.oracle.com/el5/oracle-provided-patches/>.

The following table shows the expected output from `uname -r` on Red Hat Enterprise Linux 5, Oracle Linux 5 running the Red Hat compatible kernel with Oracle bug fixes and Unbreakable Enterprise Kernel.

MINOR RELEASE	RHEL 5 KERNEL	ORACLE LINUX 5 — RED HAT COMPATIBLE KERNEL WITH ORACLE BUG FIXES	ORACLE LINUX 5 — UNBREAKABLE ENTERPRISE KERNEL
Update 1	2.6.18-53.e15	2.6.18-53.0.0.0.1.e15	Not Available
Update 2	2.6.18-92.e15	2.6.18-92.0.0.0.1.e15	Not Available
Update 3	2.6.18-128.e15	2.6.18-128.0.0.0.1.e15	Not Available
Update 4	2.6.18-164.e15	2.6.18-164.0.0.0.1.e15	Not Available
Update 5	2.6.18-194.e15	2.6.18-194.0.0.0.3.e15	2.6.32-100.24.e15
Update 6	2.6.18-238.e15	2.6.18-238.0.0.0.1.e15	2.6.32-100.26.2e15uek
Update 7	2.6.18-274.e15	2.6.18-274.0.0.0.1.e15	2.6.32-200.13.1.e15uek
Update 8	2.6.18-308.e15	2.6.18-308.0.0.0.1.e15	2.6.32-300.10.1.e15uek
Update 9	2.6.18-348.e15	2.6.18-348-0.0.0.1.e15	2.6.39-300.26.1.e15uek
Update 10	2.6.18-371.e15	2.6.18.371.0.0.0.1.e15	2.6.39-400.209.1e15uek
Update 11	2.6.18-398.e15	2.6.18-398.0.0.0.1.e15	2.6.39-400.215.10.e15uek

## Full, Verified kABI Compliance

Oracle Linux 5 with a Red Hat compatible kernel is fully kABI compatible with RHEL 5. Scripts are run to double-check whether any patches that were to be applied would have a chance of breaking kABI.

Any comparison between any kernel of Oracle Linux 5 and RHEL 5 shows absolutely no difference in kABI. Kernel modules built for any RHEL 5 kernel (since the original release) will also load on any Red Hat compatible kernel released for Oracle Linux 5.

## Compatibility

The preceding information compares Oracle Linux 5 and RHEL 5 and highlights areas of importance to application vendors from a testing and certification point of view. If your application relies on any of the examples above, you now have all the information needed about any changes that are required to run your application on Oracle Linux.

If your application does not rely on any of the examples above, it will run transparently, and Oracle is confident that re-certification is not necessary.

## Downloading Source Code and Binaries

Oracle Linux source code is available for free for download at <http://oss.oracle.com/el5/>. The binaries are freely downloadable at <http://edelivery.oracle.com/linux>. Oracle Linux 5 allows for free re-distribution of both source and binaries.

## Conclusion

Oracle Linux is fully compatible—both source and binary—with with Red Hat Enterprise Linux. This article described key points that ISVs should consider when installing and certifying their products on Oracle Linux 5.

## For More Information

- Visit the Oracle Linux Knowledge Zone on the [Oracle PartnerNetwork](#) to learn how to accelerate market opportunity and lower the cost of providing Linux solutions and support to users.
- For more information about becoming an Oracle partner, visit the [Oracle PartnerNetwork](#).
- For information on the Oracle Unbreakable Linux support program, visit [oracle.com/linux](http://oracle.com/linux).
- For ISV contact, [ol-ovm-info\\_ww@oracle.com](mailto:ol-ovm-info_ww@oracle.com)



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